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About
Social Science

THE SOCIAL SCIENCE SUCCESS STORY

This book is about research in the social sciences—that is, the sciences of human thought and human behavior. Our lives are profoundly affected by the social sciences: Our public schools are scenes of one experiment after another, as we search for better ways to help children learn. Those experiments are part of social science at work. Our cities are scenes of hundreds of programs designed, we hope, to help people develop their employment skills or gain access to health care or find shelter. . . .

All these programs are part of social science at work. We are bombarded with ads to buy this or that thing, to vote for this or that candidate, to give to this or that charity. Those ads, too, are part of social science at work.

We are always on the lookout for ways to extend and make more comfortable our own lives and the lives of our children. In the absence of any hard information about how to do that, we quite naturally mystify the forces that make some people rich and some poor, make some people sick and others healthy, and make some people die young and others live a long time. From its beginnings in the sixteenth century, modern science has been demystifying those forces. Science is about the systematic creation of knowledge that provides us with the kind of control over nature—from the weather to disease to our own buying habits—that we have always sought.

Some people are very uncomfortable with this "mastery over nature" metaphor. When all is said and done, though, few people—not even the most outspoken critics of science—would give up the material benefits of science. For example, one of science's great triumphs over nature is antibiotics. We know that overprescription of those drugs eventually sets the stage for new strains of drug-resistant bacteria, but we also know perfectly well that we're not going to stop using antibiotics. We'll rely (we

hope) on *more* science to come up with better bacteria fighters.

Air conditioning is another of science's triumphs over nature. In Florida, where I live, there is constant criticism of overdevelopment. But try getting middle-class people in my state to give up air conditioning for just one day in the summer and you'll find out in a hurry about the weakness of ideology compared to the power of creature comforts. If running air conditioners pollutes the air or uses up fossil fuel, we'll rely (we hope) on *more* science to solve those problems, too.

TECHNOLOGY AND SCIENCE

Ask 500 people, as I did in a telephone survey, to list "the major contributions that science has made to humanity" and there is strong consensus: Cures for diseases, space exploration, computers, nuclear power, satellite telecommunications, television, automobiles, artificial limbs, and transplant surgery head the list. Not one person—not one—mentioned the discovery of the dual helix structure of DNA. Just one out of 500 mentioned Einstein's theory of relativity. In other words, the contributions of science are, in the public imagination, technologies—the things that provide the mastery over nature I mentioned.

We are accustomed to thinking about the success of the physical and biological sciences, but not about that of the social sciences. Ask those same 500 people to list "the major contributions that the social and behavioral sciences have made to humanity" and you get a long silence on the phone, followed by a raggedy list, with no consensus.

I want you to know, right off the bat, that social science is serious business and that it has been a roaring success, contributing mightily to humanity's global effort to control nature. Everyone in science today, from astronomy to

zoology, uses probability theory and the array of statistical tools that have developed from that theory. It is all but forgotten that probability theory was applied social science from the start. It was developed in the seventeenth century by mathematicians Pierre Fermat (1601–1665) and Blaise Pascal (1623–1662) to help people do better in games of chance, and it was well established a century later when two other mathematicians, Daniel Bernoulli (1700–1782) and Jean D'Alambert (1717–1783), debated publicly the pros and cons of large-scale inoculations in Paris against smallpox.

In those days (before Edward Jenner's breakthrough in 1798 in the development of safe vaccinations), inoculations against smallpox involved injecting small doses of the live disease. There was a substantial risk of death from the inoculation (about 1-in-200), but the disease was ravaging cities in Europe and killing people by the tens of thousands. The problem was to assess the probability of dying from smallpox versus dying from the vaccine.

This is one of the earliest uses I have found of social science and probability theory in the making of state policy, but there were soon to be more. One of them was social security.

In 1889, Otto von Bismarck came up with a pension plan for retired German workers. Based on sound social science data, Bismarck's minister of finance suggested that 70 would be just the right age for retirement. At that time, the average life expectancy in Germany was closer to 50, and just 30% of children born then could expect to live to 70. Germany lowered the retirement age to 65 in 1916, by which time, life expectancy had edged up a bit—to around 55 (Max-Planck Institute 2002). In 1935, when the Social Security system was signed into law in the United States, Germany's magic number 65 was adopted as the age of retirement. White children born that year in the United States had an average life expectancy of about 63; for Black children it was about 51 (SAUS 1947:Table 88).

Today, life expectancy in the highly industrialized nations is close to 80—fully 30 years longer than 100 years ago—and social science data are being used more than ever in the development of public policy. How much leisure time should we have? What kinds of tax structures are needed to support a medical system that caters to the needs of 80-somethings when birth rates are low and there are fewer working adults to support the retirement of the elderly?

The success of social science is not all about probability theory and risk assessment. Fundamental breakthroughs by psychologists in understanding the stimulus-response mechanism in humans have made possible the treatment and management of phobias, bringing comfort to untold millions of people. Unfortunately, the same breakthroughs have brought us wildly successful attack ads in politics and millions of adolescents becoming hooked on cigarettes. I never said you'd *like* all the successes of social science (see Box 1.1).

Box 1.1 Life insurance: Betting on dying

Beginning in the 1840s, fundamental knowledge in the social sciences have given us great understanding of how economic and political forces impact demography. One result is life insurance. Suppose I'm the life insurance company. You bet me that you will die within 365 days. I ask you a few questions: How old are you? Do you smoke? What do you do for a living? Do you fly a private plane? Then, depending on the answers (I've got all that fundamental knowledge, remember?), I tell you that the bet is your $235 against my promise to pay your heirs $100,000 if you die within 365 days.

If you *lose the bet* and stay alive, I keep your $235. Next year, we go through this again, except that now I set your bet at $300.

This is simply spectacular human engineering at work, and it's all based on scientifically developed knowledge about risk assessment. Another product of this knowledge is state lotteries—taxes on people who are bad at math (Petty 1899 [1690]:64).

Failures in Science and Social Science

If the list of successes in the social sciences is long, so is the list of failures. School busing in the late 1960s to achieve racial integration was based on scientific findings in a report by James Coleman (1966). Those findings were achieved in the best tradition of careful scholarship. They just happened to be wrong because the scientists involved in the study didn't anticipate "White flight"—a phenomenon in which Whites abandoned cities for suburbs, taking much of the urban tax base with them and driving the inner cities into poverty.

On the other hand, the list of failures in the physical and biological sciences is just as spectacular. In the Middle Ages, alchemists tried everything they could to turn lead into gold. They had lots of people investing in them, but it just didn't work. Cold fusion is still a dream that attracts a few hardy souls. And no one who saw the explosion of the Challenger on live television in 1986 will ever forget it.

There are some really important lessons from all this. (1) Science isn't perfect but it isn't going away because it's too successful at doing what people everywhere want it to do. (2) The sciences of human thought and human behavior are much, much more powerful than most people understand them to be. (3) The power of social science, like that of the physical and biological sciences, comes from the same source: the scientific method in which ideas, based on hunches or on formal theories, are put forward, tested publicly, and replaced by ideas that produce better results. (4) Social science knowledge, like that of any science, can be used to enhance our lives or to degrade them.

WHAT ARE THE SOCIAL SCIENCES?

The social science landscape is pretty complicated. The main branches, in alphabetical order, are anthropology, economics, history, political science, psychology, social psychology, and sociology. Each of these fields has many subfields, and there are, in addition, many other disciplines in which social research is done. These include communications, criminology, demography, education, epidemiology, geography, journalism, leisure studies, nursing, indigenous studies, and social work, to name just a few.

Over time, methods for research have been developed within each of these fields, but no discipline owns any method. You may not agree with my out-front, positivist epistemology, my enthusiasm for science as mastery over nature, but the methods for collecting and analyzing data about human thought, human feelings, and human behavior belong to everyone.

Sociologists developed the questionnaire survey. People still associate sociology with that method, but questionnaire surveys are used in all the social sciences today.

Anthropologists developed the method of participant observation. It continues to be the hallmark of that discipline, but today participant observation is used in all the social sciences.

Direct observation of behavior was developed in psychology. It's still used more in

psychology (and animal ethology) than in other disciplines, but now that method belongs to the world, too.

No one is expert in all the methods available for research. But seasoned social scientists all know about the array of methods available to them for collecting and analyzing data. By the time you get through this book, you should have a pretty good idea of the range of methods used in the social sciences and what kinds of research problems are best addressed by the various methods (see Box 1.2).

Box 1.2 Research is a craft

Research is a craft. I'm not talking *analogy* here. Research isn't *like* a craft. It *is* a craft. If you know what people have to go through to become skilled carpenters or makers of clothes, you have some idea of what it takes to learn the skills for doing research. It takes practice and more practice.

Have you ever known a professional seamstress? My wife and I were doing fieldwork in Ixmiquilpan, a small town in the state of Hidalgo, Mexico, in 1962 when we met Florencia. She made dresses for little girls—Communion dresses, mostly. Mothers would bring their girls to Florencia's house. Florencia would look at the girls and say "Turn around . . . turn again . . . OK." And that was that. The mother and daughter would leave, and Florencia would start making a dress. No pattern, no elaborate measurement. There would be one fitting to make some adjustments, but that was it.

I was amazed at Florencia's ability to pick up scissors and start cutting fabric without a pattern. Then, in 1964, Carole and I went to Greece and met Irini. She made dresses for women on the island of Kalymnos where I did my doctoral fieldwork. Women would bring Irini a catalog or a picture—from Sears or from some Paris fashion show—and Irini would make the dresses. Irini was more cautious than Florencia. She made lots of measurements and took notes. But there were no patterns. She just looked at her clients, made the measurements, and started cutting fabric.

How do people learn that much? With lots of practice. And that's the way it is with research. Don't expect to do perfect research the first time out. In fact, don't ever expect to do perfect research. Just expect that each time you do a research project, you will bring more and more experience to the effort and that your abilities to gather and analyze data and write up the results will get better and better.

SOME HISTORY OF METHODS IN SOCIAL RESEARCH

In the 1830s, when modern social science began, all the practitioners thought of themselves as belonging to one large enterprise: the application of the scientific method to the study of human thought and human behavior. By the 1930s, the social sciences had divided and formed separate departments in universities and it was easy to distinguish all the disciplines from one another.

Partly, the distinctions were based on the kinds of questions people asked. Psychologists asked questions about the mind; anthropologists asked questions about culture; sociologists asked

questions about society; and so on. But, to a large extent, distinctions among the social sciences were based on the methods people used in trying to answer research questions. Psychologists used laboratory experiments; sociologists used survey questionnaires; anthropologists trekked to the field to do something they called participant observation; economists built mathematical models; historians hung out in archives and used special methods for assessing the credibility of documents.

Today, despite the proliferation of departments and journals and professional organizations, we are coming full circle. More and more, social scientists recognize that we are part of the same enterprise. We continue to ask different questions about the same set of phenomena, but we now all have access to the same methods. *The theme of this book is that methods—all methods—belong to all of us.* Whatever our theoretical orientation, whatever our discipline, a sound mix of qualitative and quantitative data is inevitable in any study of human thought and behavior. Whether we use words or numbers, we might as well use them right.

I use the term "social sciences" and not "social and behavioral sciences" because the latter is too big a mouthful. Actually, *all* of the social science disciplines are social *and* behavioral: They all deal with human behavior and thought at both the individual and group levels.

Some psychologists, for example, focus on individual thought and behavior, while others study group processes. Many sociologists and political scientists study groups of people (labor unions, firms, hospitals, churches, nations) and how those groups are organized and connected to one another, but many also study individual behavior (sexual preferences, consumer choices, responses to illness). They aggregate their data to understand societies, but they ask their questions of individual people. Anthropologists focus on cultures—a supremely aggregate phenomenon—but many are concerned with individuals. In-depth interviews produce rich data about the experiences that real people have being labor migrants, or living with AIDS, or making it as a single parent, or being a surgeon, a cop, or an intravenous drug user.

EPISTEMOLOGY— DIFFERENT WAYS OF KNOWING

The problem with trying to write a book about research methods (beside the fact that there are so *many* of them) is that the word "method" has at least three meanings. At the most general level, it means **epistemology**, or the study of how we know things. At a still-pretty-general level, it's about strategic choices, like whether to do participant observation fieldwork, dig up information from libraries and archives, or run an experiment. These are **strategic methods**, which means that they comprise lots of methods at once.

At the specific level, method is about **technique**—what kind of sample to use, whether to do face-to-face interviews or use the telephone, whether to use an interpreter or learn the local language well enough to do your own interviewing, whether to use a Solomon four-group design or a static-group comparison design in running an experiment, and so on.

When it comes to epistemology, there are several key questions. One is whether you subscribe to the philosophical principles of **rationalism** or **empiricism**. Another is whether you buy the assumptions of the scientific method, often called **positivism** in the social sciences, or favor the competing method, often called **humanism** or **interpretivism**. These are tough questions, with no easy answers. I discuss them in turn.

Rationalism, Empiricism, and Kant

The clash between rationalism and empiricism is at least as old as ancient Greek philosophy. It is still a hotly debated topic in the philosophy of knowledge.

Rationalism is the idea that human beings achieve knowledge because of their capacity to reason. From the rationalist perspective, there are a priori truths, which, if we just prepare our minds adequately, will become evident to us. From this perspective, progress of the human intellect over the centuries has resulted from reason. Many great thinkers, from Plato (428–327 BCE) to Leibnitz (Gottfried Wilhelm Baron von Leibniz, 1646–1716) subscribed to the rationalist principle of knowledge. "We hold these truths to be self-evident . . ." is an example of assuming a priori truths.

The competing epistemology is empiricism. For empiricists, the only knowledge that human beings acquire is from sensory experience. For empiricists, like John Locke (1632–1704), human beings are born **tabula rasa**—with a "clean slate." What we come to know is the result of our experience written on that slate. David Hume (1711–1776) elaborated the empiricist philosophy of knowledge: We see and hear and taste things, and, as we accumulate experience, we make generalizations. We come, in other words, to understand what is true from what we are exposed to.

This means, Hume held, that we can never be absolutely sure that what we know is true. (By contrast, if we reason our way to a priori truths, we can be certain of whatever knowledge we have gained.) Hume's brand of **skepticism** is a fundamental principle of modern science. The scientific method, as it's understood today, involves making incremental improvements in what we know, edging toward truth but never quite getting there—and always being ready to have yesterday's truths overturned by today's empirical findings.

Immanuel Kant (1724–1804) proposed a way out, a third alternative. A priori truths exist, he said, but if we see those truths it's because of the way our brains are structured. The human mind, said Kant, has a built-in capacity for ordering and organizing sensory experience. This was a powerful idea that led many scholars to look to the human mind itself for clues about how human behavior is ordered.

Noam Chomsky, for example, proposed that human beings can learn any language because humans have a universal grammar already built into their minds. This would account, he said, for the fact that material from one language can be translated into any other language.

A competing theory was proposed by B. F. Skinner, a radical behaviorist. Humans learn their language, Skinner said, the way all animals learn everything, by operant conditioning, or reinforced learning. Babies learn the sounds of their language, for example, because people who speak the language reward babies for making the "right" sounds. A famous debate between Skinner (1957) and Chomsky (1959) more than 50 years ago has been a hot topic for partisans on both sides ever since (Palmer 2006; Stemmer 2004; Virués-Ortega 2006).

The intellectual clash between empiricism and rationalism creates a dilemma for all social scientists. Empiricism holds that people learn their values and therefore that values are relative. I consider myself an empiricist, but I accept the rationalist idea that there are universal truths about right and wrong.

I'm not in the least interested, for example, in transcending my disgust with, or taking a value-neutral stance about genocide in Germany of the 1940s, or in Cambodia of the 1970s, or in Bosnia and Rwanda of the 1990s, or in Sudan in 2010. I can never say that the Aztec practice of sacrificing thousands of captured prisoners was just another religious practice that one has to tolerate to be a good cultural relativist. No one has ever found a satisfactory way out of this dilemma. As a practical matter, I recognize that both rationalism and empiricism have contributed to our current understanding of the diversity of human behavior.

Modern social science has its roots in the empiricists of the French and Scottish

Enlightenment. The early empiricists of the period, like David Hume, looked outside the human mind, to human behavior and experience, for answers to questions about human differences. They made the idea of a mechanistic science of humanity as plausible as the idea of a mechanistic science of other natural phenomena (**Further Reading:** epistemology).

In the rest of this chapter, I outline the assumptions of the scientific method and how they apply to the study of human thought and behavior in the social sciences today.

THE NORMS OF SCIENCE: THE RULES AND ASSUMPTIONS OF SCIENCE

The norms of science are clear. Science is "an objective, logical, and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge" (Lastrucci 1963:6). Three words in Lastrucci's definition—"objective," "method," and "reliable"—are especially important.

1. *Objective*. The idea of truly objective inquiry has long been understood to be a delusion. Scientists do hold, however, that *striving* for objectivity is useful. In practice, this means being explicit about our measurements (whether we make them in words or in numbers), so that others can more easily find the errors we make. We constantly try to improve measurement, to make it more precise and more accurate, and we submit our findings to peer review—what Robert Merton called the "organized skepticism" of our colleagues (1938:334–36).

2. *Method*. Each scientific discipline has developed a set of techniques for gathering and handling data, but there is, in general, a single scientific method. The method is based on three assumptions: (1) reality is "out there" to

be discovered; (2) direct observation is the way to discover it; and (3) material explanations for observable phenomena are always sufficient, and metaphysical explanations are never needed. Direct observation can be done with the naked eye or enhanced with various instruments (like microscopes); and human beings can be improved by training as instruments of observation. (I'll say more about that in Chapters 12 and 14 on participant observation and direct observation.)

Metaphysics refers to explanations of phenomena by any nonmaterial force, such as the mind or spirit or a deity—things that, by definition, cannot be investigated by the methods of science. This does not deny the existence of metaphysical knowledge, but scientific and metaphysical knowledge are quite different. There are time-honored traditions of metaphysical knowledge—knowledge that comes from introspection, self-denial, and spiritual revelation—in cultures across the world.

In fact, science does not reject metaphysical knowledge—though individual scientists may do so—only the use of metaphysics to explain natural phenomena. The great insights about the nature of existence, expressed throughout the ages by poets, theologians, philosophers, historians, and other humanists may one day be understood as biophysical phenomena, but so far, they remain tantalizingly metaphysical.

3. *Reliable*. Something that is true in Detroit is just as true in Vladivostok and Nairobi. Knowledge can be kept secret by nations, but there can never be such a thing as "Venezuelan physics," "American chemistry," or "Kenyan geology."

Not that it hasn't been tried. From around 1935–1965, T. D. Lysenko, with the early help of Josef Stalin, succeeded in gaining absolute power over biology in what was then the Soviet Union. Lysenko developed a Lamarckian theory of genetics, in which human-induced

changes in seeds would, he claimed, become inherited. Despite public rebuke from the entire non-Soviet scientific world, Lysenko's "Russian genetics" became official Soviet policy—a policy that nearly ruined agriculture in the Soviet Union and its European satellites well into the 1960s (Joravsky 1970) (**Further Reading:** the norms of science).

THE DEVELOPMENT OF SCIENCE AS AN INSTITUTION IN MODERN SOCIETIES

Early Ideas

The scientific method is barely 400 years old and its systematic application to human thought and behavior is less than half that. Aristotle insisted that knowledge should be based on experience and that conclusions about general cases should be based on the observation of more limited ones. But Aristotle did not advocate disinterested, objective accumulation of reliable knowledge. Moreover, like Aristotle, all scholars until the seventeenth century relied on metaphysical concepts, like the soul, to explain observable phenomena. Even in the nineteenth century, biologists still talked about "vital forces" as a way of explaining the existence of life.

Early Greek philosophers, like Democritus (460–370 BCE) who developed the atomic theory of matter, were certainly materialists, but one ancient scholar stands out for the kind of thinking that would eventually divorce science from studies of mystical phenomena. In his single surviving work, a poem entitled *On the Nature of the Universe* (1998), Titus Lucretius Carus (98–55 BCE) suggested that everything that existed in the world had to be made of some material substance. Consequently, if the soul and the

gods were real, they had to be material, too (see Minadeo 1969). But Lucretius' work did not have much impact on the way knowledge was pursued, and even today his work is little appreciated in the social sciences (see Harris [1968] and Carneiro [2010] for exceptions).

The Age of Exploration, Printing, and Modern Science

Skip to around 1400, when a series of revolutionary changes began in Europe—some of which are still going on—that transformed Western society and other societies around the world. In 1413, the first Spanish ships began raiding the coast of West Africa, hijacking cargo and acquiring slaves from Islamic traders. New tools of navigation (the compass and the sextant) made it possible for adventurous plunderers to go farther and farther from European shores in search of booty.

These breakthroughs were like those in architecture and astronomy by the ancient Mayans and Egyptians. They were based on systematic observation of the natural world but they were not generated by the social and philosophical enterprise we call science. That required several other revolutions.

Johannes Gutenberg completed the first edition of the Bible on his newly invented printing press in 1455. (Printing presses had been used earlier in China, Japan, and Korea, but lacked movable type.) By the end of the fifteenth century, every major city in Europe had a press. Printed books provided a means for the accumulation and distribution of knowledge. Eventually, printing would make organized science possible, but it did not by itself guarantee the objective pursuit of reliable knowledge any more than the invention of writing had done four millennia before (N. Z. Davis 1981; Eisenstein 1979).

Martin Luther was born just 15 years after Gutenberg died. No historical figure is more associated with the Protestant Reformation,

which began in 1517, and the Reformation added much to the history of modern science. It challenged the authority of the Roman Catholic Church to be the sole interpreter and disseminator of theological doctrine. The Protestant affirmation of every person's right to interpret scripture required literacy on the part of everyone, not just the clergy. The printing press made it possible for every family of some means to own (and read) its own Bible. This promoted widespread literacy in Europe and later in the United States, and this, along with the ability of scholars to publish their work at relatively low cost, helped make possible the development of science as an organized activity.

Galileo

The direct philosophical antecedents of modern science came at the end of the sixteenth century. If I had to pick one single figure on whom to bestow the honor of founding modern science, it would have to be Galileo Galilei (1564–1642). His best-known achievement was his thorough refutation of the Ptolemaic geocentric (Earth-centered) theory of the heavens. But he did more than just insist that scholars *observe* things rather than rely on metaphysical dogma to explain them. He developed the idea of the experiment by causing things to happen (rolling balls down differently inclined planes, for example, to see how fast they go) and measuring the results.

Galileo became professor of mathematics at the University of Padua when he was 28. He developed a new method for making lenses and used the new technology to study the motions of the planets. He concluded that the sun (as Copernicus claimed), not the Earth (as the ancient scholar Ptolemy had claimed) was at the center of the solar system.

This was one more threat to their authority that Roman church leaders didn't need at the

time. They already had their hands full, what with breakaway factions in the Reformation and other political problems. The church reaffirmed its official support for the Ptolemaic theory, and in 1616 Galileo was ordered not to espouse either his refutation of it or his support for the Copernican heliocentric (sun-centered) theory of the heavens.

Galileo waited 16 years and published the book that established science as an effective method for seeking knowledge. The book's title was *Dialogue Concerning the Two Chief World Systems, Ptolemaic and Copernican*, and it still makes fascinating reading (Galilei 1997 [1632]). Between the direct observational evidence that he had gathered with his telescopes and the mathematical analyses that he developed for making sense of his data, Galileo hardly had to espouse anything. The Ptolemaic theory was simply rendered obsolete.

In 1633, Galileo was convicted by the Inquisition for heresy and disobedience. He was ordered to recant his sinful teachings and was confined to house arrest until his death in 1642. He nearly published *and* perished. In 1992, Pope John Paul II reversed the Roman Catholic Church's 1616 ban on teaching the Copernican theory and apologized for its condemnation of Galileo.

Bacon and Descartes

Two other figures are often cited as founders of modern scientific thinking: Francis Bacon (1561–1626) and René Descartes (1596–1650). Bacon is known for his emphasis on induction, the use of direct observation to confirm ideas and the linking together of observed facts to form theories or explanations of how natural phenomena work. Bacon correctly never told us how to get ideas or how to accomplish the linkage of empirical facts. Those activities remain essentially humanistic—you think hard (Box 1.3).

Box 1.3 On induction and deduction

There are two great epistemological approaches in all research: **induction** and **deduction**. In its idealized form, inductive research involves the search for pattern from observation and the development of explanations–theories–for those patterns through a series of hypotheses. The hypotheses are tested against new cases, modified, retested against yet more cases, and so on, until saturation occurs–that is, new cases stop requiring more testing.

By contrast, in its idealized form, deductive research starts with theories (derived from common sense, from observation, or from the literature) and hypotheses derived from theories, and then moves on to observations–which either confirm or falsify the hypotheses. (We'll see examples of these two approaches in Chapter 19 on grounded theory and content analysis.)

Real research is never purely inductive or purely deductive. In general, the less we know about a research problem, the more inductive we'll be–the more we let observation be our guide–and the more we know about a problem, the more deductive we'll be. **Exploratory research** is, therefore, likely to be pretty inductive, while **confirmatory research** is likely to be deductive.

When I started working with the Ñähñu Indians of central Mexico, for example, I wondered why so many parents wanted their children *not* to learn how to read and write Ñähñu in school. As I became aware of the issue, I started asking everyone I talked to about it. With each new interview, pieces of the puzzle fell into place. This was a really, really inductive approach. After a while, I came to understand the problem: It's a long, sad story, repeated across the world by indigenous people who have learned to devalue their own cultures and reject their own languages in the hope that this will help their children do better economically. After that, I started right off by asking people about my hunches–for example, about the economic penalty of speaking Spanish in Mexico with an identifiable Indian accent. In other words, I switched to a really, really deductive approach.

It's messy, but this paradigm for building knowledge–the continual combination of inductive and deductive research–is used by scholars across the humanities and the sciences alike and has proved itself, over thousands of years. If we know anything about how and why stars explode or about how HIV is transmitted or about why women lower their fertility when they enter the labor market, it's because of this combination of effort. Human experience–the way real people experience real events–is endlessly interesting because it is endlessly unique, and so, in a way, the study of human experience is always exploratory and is best done inductively.

On the other hand, we also know that human experience is patterned. A migrant from Mexico who crosses the U.S. border one step ahead of the authorities lives through a unique experience and has a unique story to tell, but twenty such stories will almost certainly reveal similarities.

To Bacon goes the dubious honor of being the first "martyr of empiricism." In March 1626, at the age of 65, Bacon was driving through a rural area north of London. He had noticed earlier that both cold and fire impeded putrefaction (Bacon 1902 [1620]:137). To test his observation, he stopped his carriage, bought a hen from a local resident, killed the

hen, and stuffed it with snow. Bacon was right—the cold snow did keep the bird from rotting—but he himself caught bronchitis and died a month later (Lea 1980).

Descartes didn't make any systematic, direct observations—he did neither fieldwork nor experiments—but in his *Discourse on Method* (1960 [1637]), and particularly in his monumental *Meditations* (1993 [1641]), he distinguished between the mind and all external material phenomena. He also outlined clearly his vision of a universal science of nature based on direct experience and the application of reason—that is, observation and theory.

Newton

Isaac Newton (1643–1727) pressed the scientific revolution at Cambridge University. Along with Leibniz, he invented calculus and used it to develop celestial mechanics and other areas of physics. Just as important, he devised the **hypothetico-deductive model of science** that combines both induction (empirical observation) and deduction (reason) into a single, unified method (Toulmin 1980).

In this model, which more accurately reflects how scientists actually conduct their work, it makes no difference where you get an idea: from data, from a conversation with your brother-in-law, or from just plain, hard, reflexive thinking. What matters is whether you can *test* your idea against data in the real world. This model seems rudimentary to us now, but it is of fundamental importance and was quite revolutionary in the late seventeenth century (**Further Reading:** history of science).

Science, Money, and War

The scientific approach to knowledge was established just as Europe began to experience the growth of industry and the development of large cities. Those cities were filled with uneducated factory laborers. This created a need for increased productivity in agriculture among those not engaged in industrial work.

Optimism for science ran high, as it became obvious that the new method for acquiring knowledge about natural phenomena promised bigger crops, more productive industry, and more successful military campaigns. The Royal Society in England has its roots in meetings among a group of philosophers in London in 1644 who did experiments (much like a club . . . they paid dues for the experiments).

One of the leaders of that group was John Wilkins. In 1648, he published *Mathematicall Magick,* a book about the benefit of science in developing new technology, "particularly for such Gentlemen as employ their Estates in those chargeable Adventures of Draining Mines, Coalpits, etc." The organizing mandate for the French Academy of Science academy (1666) included a modest proposal to study "the explosive force of gunpowder enclosed (in small amounts) in an iron or very thick copper box" (Easlea 1980:216).

As the potential benefits of science became evident, political support increased across Europe. More scientists were produced. More university posts were created for them to work in. More laboratories were established at academic centers. Journals and learned societies developed as scientists sought more outlets for publishing their work. Sharing knowledge through journals made it easier for scientists to do their own work and to advance through the university ranks. Publishing and sharing knowledge became a material benefit, and the behaviors were soon supported by a value, a norm.

The norm was so strong that European nations at war allowed enemy scientists to cross their borders freely in pursuit of knowledge. In 1780, Reverend Samuel Williams of Harvard University applied for and received a grant from the Massachusetts legislature to observe a total eclipse of the sun predicted for 27 October. The perfect spot, he said, was an island off the coast of Massachusetts.

Unfortunately, Williams and his party would have to cross Penobscot Bay. The American Revolutionary War was still on, and the bay was controlled by the British. The speaker of the Massachusetts House of Representatives, John Hancock, wrote a letter to the commander of the British forces, saying "Though we are politically enemies, yet with regard to Science it is presumable we shall not dissent from the practice of civilized people in promoting it" (Rothschild 1981, quoted in Bermant 1982:126). The appeal of one "civilized" person to another worked. Williams got his free passage.

THE DEVELOPMENT OF SOCIAL SCIENCE

Locke

It is fashionable these days to say that social science should not imitate physics. As it turns out, physics and social science were developed at about the same time, and on the same philosophical basis, by two friends, Isaac Newton and John Locke (1632–1704). It would not be until the nineteenth century that a formal program of applying the scientific method to the study of humanity would be proposed by Auguste Comte, Claude-Henri de Saint-Simon, Adolphe Quételet, and John Stuart Mill (more about them in a bit). But Locke understood that the rules of science applied equally to the study of celestial bodies (what Newton was interested in) and to human behavior (what Locke was interested in).

In his *Essay Concerning Human Understanding* (1996 [1690]), Locke reasoned that since we cannot see everything, and since we cannot even record perfectly what we do see, some knowledge will be closer to the truth than other knowledge. Prediction of the behavior of planets might be more accurate than prediction of human behavior, but both predictions should be based on better and better observation, measurement, and reason (see Nisbet 1980; Woolhouse 1996).

Voltaire, Condorcet, and Rousseau

The legacy of Descartes, Galileo, and Locke was crucial to the eighteenth-century **Enlightenment** and to the development of social science. Voltaire (François Marie Arouet, 1694–1778) was an outspoken proponent of Newton's nonreligious approach to the study of all natural phenomena, including human behavior (Voltaire 1967 [1738]). In several essays, Voltaire introduced the idea of a science to uncover the laws of history. This was to be a science that could be applied to human affairs and *enlightened* those who governed so that they might govern better.

Other Enlightenment figures had quite specific ideas about the progress of humanity. Marie Jean de Condorcet (1743–94) described all of human history in 10 stages, beginning with hunting and gathering, and moving up through pastoralism, agriculture, and several stages of Western states. The 9th stage, he reckoned, began with Descartes and ended with the French Revolution and the founding of the republic. The last stage was the future, reckoned as beginning with the French Revolution.

Jean-Jacques Rousseau (1712–1778), by contrast, believed that humanity had started out in a state of grace, characterized by equality of relations, but that civilization, with its agriculture and commerce, had corrupted humanity and led to slavery, taxation, and other inequalities. Rousseau was not, however, a raving romantic, as is sometimes supposed. He did not advocate that modern people abandon civilization and return to hunt their food in the forests. Rousseau held that the state embodied humanity's efforts, through a **social contract**, to control the evils brought about by civilization. In his classic work *On the Social Contract*, Rousseau (1988 [1762]) laid out a plan for a state-level society based on equality and agreement between the governed and those who govern.

The Enlightenment philosophers, from Bacon to Rousseau, produced a philosophy that focused on the use of knowledge in service to the improvement of humanity, or, if that weren't possible, at least to the amelioration of its pain. The idea that science and reason could lead humanity toward perfection may seem naive to some people these days, but the ideas of John Locke, Jean Jacques Rousseau, and other Enlightenment figures were built into the writings of Thomas Paine (1737–1809) and Thomas Jefferson (1743–1826), and were incorporated into the rhetoric surrounding rather sophisticated events—like the American and French Revolutions (**Further Reading:** history of social science).

THE VARIETIES OF POSITIVISM

Early Positivism: Quételet, Saint-Simon, and Comte

The person most responsible for laying out a program of mechanistic social science was Auguste Comte (1798–1857). In 1824, he wrote: "I believe that I shall succeed in having it recognized . . . that there are laws as well defined for the development of the human species as for the fall of a stone" (quoted in Sarton 1935:10).

Comte could not be bothered with the empirical research required to uncover the Newtonian laws of social evolution that he believed existed. Comte was content to deduce the social laws and to leave "the verification and development of them to the public" (1875–1877, III:xi; quoted in Harris 1968).

Not so Adolphe Quételet (1796–1874), a Belgian astronomer who turned his skills to both fundamental and applied social research. He developed life expectancy tables for insurance companies and, in his book *A Treatise on Man* (1969 [1842]), he presented statistics on crime and mortality in Europe. The first edition

of that book (1835) carried the audacious subtitle "Social Physics," and, indeed, Quételet extracted some very strong generalizations from his data. He showed that, for the Paris of his day, it was easier to predict the proportion of men of a given age who would be in prison than the proportion of those same men who would die in a given year. "Each age [cohort]" said Quételet, "paid a more uniform and constant tribute to the jail than to the tomb" (1969 [1842]:viii).

Despite Quételet's superior empirical efforts, he did not succeed in building a following around his ideas for social science. But Claude-Henri de Saint-Simon (1760–1825) did, and he was apparently quite a figure. He fought in the American Revolution, became a wealthy man in land speculation in France, was imprisoned by Robespierre, studied science after his release, and went bankrupt living flamboyantly.

Saint-Simon had the audacity to propose that scientists become priests of a new religion that would further the emerging industrial society and would distribute wealth equitably. The idea was taken up by industrialists after Saint-Simon's death in 1825, but the movement broke up in the early 1830s, partly because its treasury was impoverished by paying for some monumental parties (see Durkheim 1958).

Saint-Simon was the originator of the so-called **positivist school** of social science, but Comte developed the idea in a series of major books. Comte tried to forge a synthesis of the great ideas of the Enlightenment—the ideas of Kant, Hume, Voltaire—and he hoped that the new science he envisioned would help to alleviate human suffering. Between 1830 and 1842, Comte published a six-volume work, *The System of Positive Philosophy*, in which he proposed his famous "law of three stages" through which knowledge developed (see Comte 1974 [1855], 1975).

In the first stage of human knowledge, said Comte, phenomena are explained by invoking the existence of capricious gods whose whims

can't be predicted by human beings. Comte and his contemporaries proposed that religion itself evolved, beginning with the worship of inanimate objects (fetishism) and moving up through polytheism to monotheism. But any reliance on supernatural forces as explanations for phenomena, said Comte, even a modern belief in a single deity, represented a primitive and ineffectual stage of human knowledge.

Next came the metaphysical stage, in which explanations for observed phenomena are given in terms of "essences," like the "vital forces" commonly invoked by biologists of the time. The so-called positive stage of human knowledge is reached when people come to rely on empirical data, reason, and the development of scientific laws to explain phenomena. Comte's program of positivism, and his development of a new science he called "sociology," is contained in his four-volume work *System of Positive Polity*, published between 1875 and 1877.

I share many of the sentiments expressed by the word "positivism," but I've never liked the word itself. I suppose we're stuck with it. Here is John Stuart Mill (1866) explaining the sentiments of the word to an English-speaking audience: "Whoever regards all events as parts of a constant order, each one being the invariable consequent of some antecedent condition, or combination of conditions, accepts fully the Positive mode of thought" (p. 15) and "All theories in which the ultimate standard of institutions and rules of actions was the happiness of mankind, and observation and experience the guides . . . are entitled to the name Positive" (p. 69).

Mill thought that the word "positive" was not really suited to English and would have preferred to use phenomenal or experiential in his translation of Comte. I wish Mill had trusted his gut on that one.

Comte's Excesses

Comte wanted to call the new positivistic science of humanity "social physiology," but Saint-Simon had used that term. Comte tried

out the term "social physics," but apparently dropped it when he found that Quételet was using it, too. The term "sociology" became somewhat controversial; language puritans tried for a time to expunge it from the literature on the grounds that it was a bastardization—a mixture of both Latin (*societas*) and Greek (*logo*) roots. Despite the dispute over the name of the discipline, Comte's vision of a scientific discipline that both focused on and served society found wide support.

Unfortunately, Comte, like Saint-Simon, had more in mind than just the pursuit of knowledge for the betterment of humankind. Comte envisioned a class of philosophers who, with support from the state, would direct all education. They would advise the government, which would be composed of capitalists "whose dignity and authority," explained John Stuart Mills, "are to be in the ratio of the degree of generality of their conceptions and operations—bankers at the summit, merchants next, then manufacturers, and agriculturalists at the bottom" (1866:122).

It got worse. Comte proposed his own religion; condemned the study of planets that were not visible to the naked eye; advocated burning most books except for a hundred or so of the ones that people needed to become best educated; and opposed women working. "As his thoughts grew more extravagant," Mill tells us, "Comte's self-confidence grew more outrageous. The height it ultimately attained must be seen, in his writings, to be believed" (1866:130).

Comte attracted a coterie of admirers who wanted to implement the master's plans. Mercifully, they are gone (we hope), but for many scholars, positivism still carries the taint of Comte's outrageous ego.

The Activist Legacy of Comte's Positivism

Despite Comte's excesses, there were three fundamental ideas in his brand of positivism that captured the imagination of many scholars in

the nineteenth century and continue to motivate many social scientists, including me. The first is the idea that the scientific method is the surest way to produce knowledge about the natural world. The second is that scientifically produced knowledge is effective—it lets us control nature, whether we're talking about the weather, or disease, or our own fears, or buying habits. And the third is that effective knowledge can be used to improve human lives. As far as I'm concerned, those ideas haven't lost any of their luster.

These days, positivism is often linked to support for whatever power relations happen to be in place. It's an astonishing turnabout, because historically, positivism was linked to social activism. *The Subjection of Women* (1869), by John Stuart Mill, advocated full equality for women. Adolphe Quételet, the Belgian astronomer, demographer, and criminologist, was a committed social reformer.

The legacy of positivism as a vehicle for social activism is clear in Jane Addams's work with destitute immigrants at Chicago's Hull House (1926); in Sidney and Beatrice Webb's attack on the British medical system (1910); in Charles Booth's account of the conditions under which the poor lived in London (1902); and in Florence Nightingale's (1871) assessment of death rates in maternity hospitals (see McDonald [1993] for an extended account of Nightingale's long-ignored work).

The central position of positivism as a philosophy of knowledge is that experience is the foundation of knowledge. We record what we experience—what we see others do, what we hear others say, what we feel others feel. The quality of the recording, then, becomes the key to knowledge. Can we, in fact, record what others experience? Yes, of course we can. Are there pitfalls in doing so? Yes, of course there are. To some social researchers, these pitfalls are evidence of natural limits to social science; to others, like me, they are a challenge to extend the current limits by improving measurement. The

fact that knowledge is tentative is something we all learn to live with.

Later Positivism I: The Vienna Circle

Positivism has taken some interesting turns. Ernst Mach (1838–1916), an Austrian physicist, took Hume's arch-empiricist stance further than even Hume might have done himself: If you could not verify something, insisted Mach, you should question its existence. If you can't see it, it isn't there. This extreme stance led Mach to reject the atomic theory of physics because, at the time, atoms could not be seen.

The discussion of Mach's ideas was the basis of a seminar group that met in Vienna and Berlin during the 1920s and 1930s. The group, composed of mathematicians, philosophers, and physicists, came to be known as the Vienna Circle of logical positivists. They were also known as logical empiricists, and when social scientists today discuss positivism, it is often this particular brand that they have in mind (see Mach 1976).

The term logical empiricism better reflects the philosophy of knowledge of the members of the Vienna Circle than does logical positivism. Unfortunately, Feigl and Blumberg used logical positivism in the title of their 1931 article in the *Journal of Philosophy* in which they laid out the program of their movement, and the name positivism stuck—again (L. D. Smith 1986).

The fundamental principles of the Vienna Circle were that knowledge is based on experience and that metaphysical explanations of phenomena were incompatible with science. Science and philosophy, they said, should attempt to answer only scientifically answerable questions. A question like "Was Mozart or Brahms the better composer?" can only be addressed by metaphysics and should be left to artists.

In fact, the logical positivists of the Vienna Circle did not see art—painting, sculpture, poetry, music, literature, and literary criticism—as conflicting with science. The arts, they said,

allow people to express personal visions and emotions and are legitimate unto themselves. Since poets do not claim that their ideas are testable expressions of reality, their ideas can be judged on their own merits as evocative and insightful, or not. Therefore, any source of wisdom (like poetry) that generates ideas, and science, which tests ideas, are mutually supportive and compatible (Feigl 1980). I find this eminently sensible. Sometimes, when I read a really great line of poetry, like Robert Frost's line from *The Mending Wall*, "Good fences make good neighbors," I think "How could I *test* that? Do good fences *always* make good neighbors?" When sheep herders fenced off grazing lands in nineteenth-century Texas, keeping cattle out of certain regions, it started range wars.

Listen to what Frost had to say about this in the same poem: "Before I built a wall I'd ask to know/ What I was walling in or walling out./ And to whom I was like to give offence." The way I see it, the search for understanding is a human activity, no matter who does it and no matter what epistemological assumptions they follow.

Understanding begins with questions and with ideas about how things work. When *do* fences make good neighbors? Why do women make less money, on average, for the same work as men in most industrialized countries? Why is Barbados's birth rate falling faster than Saudi Arabia's? Why is there such a high rate of alcoholism on Native American reservations? Why do nation states, from Italy to Kenya, almost universally discourage people from maintaining minority languages? Why do public housing programs often wind up as slums? If advertising can get children hooked on cigarettes, why is public service advertising so ineffective in lowering the incidence of high-risk sex among adolescents?

Later Positivism II: Instrumental Positivism

The practice that many researchers today love to hate, however, is neither the positivism of Auguste Comte nor that of the Vienna Circle. It is, instead, what Christopher Bryant (1985:137) called **instrumental positivism**.

In his 1929 presidential address to the American Sociological Society, William F. Ogburn laid out the rules. In turning sociology into a science, he said, "it will be necessary to crush out emotion." Further, "it will be desirable to taboo ethics and values (except in choosing problems); and it will be inevitable that we shall have to spend most of our time doing hard, dull, tedious, and routine tasks" (Ogburn 1930:10). Eventually, he said, there would be no need for a separate field of statistics because "all sociologists will be statisticians" (p. 6).

THE REACTIONS AGAINST POSITIVISM

That kind of rhetoric just begged to be reviled. In *The Counter-Revolution of Science*, Friedrich von Hayek (1952) laid out the case against the possibility of what Ogburn imagined would be a science of humanity. In the social sciences, Hayek said, we deal with mental phenomena, not with material facts. The data of the social sciences, Hayek insisted, are not susceptible to treatment as if they were data from the natural world. To pretend that they are is what he called "scientism."

Furthermore, said Hayek, scientism is more than just foolish. It is evil. The ideas of Comte and of Marx, said Hayek, gave people the false idea that governments and economies could be managed scientifically and this, he concluded, had encouraged the development of the communism and totalitarianism that seemed to be sweeping the world when he was writing in the 1950s (Hayek 1952:110, 206).

I have long appreciated Hayek's impassioned and articulate caution about the need to protect liberty, but he was wrong about positivism and even about scientism. Science did

not cause Nazi or Soviet tyranny any more than religion caused the tyranny of the Crusades or the burning of witches in seventeenth-century Salem, Massachusetts. Tyrants of every generation have used any means, including any convenient epistemology or cosmology, to justify and further their despicable behavior. Whether tyrants seek to justify their power by claiming that they speak to the gods or to scientists, the awful result is the same. But the *explanation* for tyranny is surely neither religion nor science.

It is also apparent that an effective science of human behavior exists, no matter whether it's called positivism or scientism or human engineering or anything else. However distasteful it may be to some, John Stuart Mill's simple formula for a science applied to the study of human phenomena has been very successful in helping us understand (and control) human thought and behavior. Whether we like the outcomes is a matter of conscience, but no amount of moralizing diminishes the fact of success.

Today's truths are tomorrow's rubbish, in the social sciences just as in physics, and no epistemological tradition has a patent on interesting questions or on good ideas about the answers to such questions. Several competing traditions offer alternatives to positivism in the social sciences. These include humanism, hermeneutics, and phenomenology (**Further Reading:** positivism).

Hermeneutics

The ancient Greek god Hermes (known as Mercury in the Roman pantheon—he of the winged hat) had the job of delivering and interpreting for humans the messages of the other gods. From this came the Greek word *hermeneus*, or interpreter, and from that comes our word **hermeneutics**, the continual interpretation and reinterpretation of texts.

Modern hermeneutics in social science is an outgrowth of the Western tradition of biblical exegesis. In that tradition, the Old and New Testaments are assumed to contain eternal truths, put there by an omnipotent creator through some emissaries—prophets, writers of the gospels, and the like. The idea is to continually interpret the words of those texts to understand their original meaning and their directives for living in the present (see Box 1.4).

Box 1.4 Hermeneutics and holy writ

Rules for reconciling contradictions in scripture were developed by early Talmudic scholars, about a hundred years after the death of Jesus of Nazareth. For example, one of the rules was that "the meaning of a passage can be derived either from its context or from a statement later on in the same passage" (Jacobs 1995:236). Another was that "when two verses appear to contradict one another, a third verse can be discovered which reconciles them" (Jacobs 1995:236). Today, the thirteen Talmudic rules for interpreting scripture remain part of the morning service among Orthodox Jews, and Talmudic hermeneutics continues to be central to Jewish theology.

Scholars of the New Testament have used hermeneutic reasoning since the time of Augustine (354–430) to determine the order in which the three synoptic gospels (Mark, Mathew, and Luke) were written. They are called synoptic gospels because they are all synopses of the same events and can be lined up and compared for details. Whenever there is a discrepancy about the order of events, Mark and Mathew agree or Mark and Luke agree, but Mathew and Luke almost never agree against Mark. There are many theories about what

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caused this—including some that involve one or more of the gospels being derived from an undiscovered source. Research on this problem continues to this day (for a review, see Stein 1987).

Today, in the United States, constitutional law is a form of biblical hermeneutics. Jurists take it as their task to consider what the writers of each phrase in the U.S. Constitution meant when they wrote the phrase, and to interpret that meaning in light of current circumstances. It is exegesis on the U.S. Constitution that has produced entirely different interpretations across time about the legality of slavery, abortion, women's right to vote, the government's ability to tax income, and so on.

Although they have not influenced Western social science, there are long exegetical traditions in Islam (Abdul-Rahman 2003; Abdul-Raof 2010; Calder 1993), Hinduism (Sherma and Sharma 2008; Timm 1992), Buddhishm (Sharf 2002), and other religions.

The hermeneutic tradition has come into the social sciences with the close and careful study of all free-flowing texts, including political speeches, folktales and myths, life histories, letters from soldiers in battle to their families at home, transcriptions of doctor-patient interactions, sitcoms. . . . Think, for example, of the stories taught in U.S. schools about Columbus's voyages. The hermeneutic approach would stress that: (1) the stories contain some underlying meaning, at least for the people who tell them; and (2) it is our job to discover that meaning, knowing that the meaning can change over time and can also be different for subgroups within a society—like Americans of northern and central European descent, African Americans, Chicanos, and Navajos, for example.

The idea that culture is "an assemblage of texts" is the basis for the interpretive scholarship of Clifford Geertz (1973). And Paul Ricoeur, arguing that action, like the written word, has meaning to actors, extended the hermeneutic approach even to free-flowing behavior itself (1981, 2007).

Today, hermeneutic method is practiced across the social sciences and is applied to the study of all kinds of texts, including jokes, sermons, songs, and actions. For a hermeneutic analysis of African American sermons, for example, see Hamlet (1994) (**Further Reading**: hermeneutics and social science).

Phenomenology

Like positivism, **phenomenology** is a philosophy of knowledge that emphasizes observation of phenomena. Unlike positivists, however, phenomenologists emphasize the experience of phenomena to determine their essences, the things that make them what they are. Gold, for example, has been a universal currency for centuries, but variations in its price are accidents of history and do not reflect its essence. This distinction between essential and accidental properties of things was first made by Aristotle in his *Metaphysics* (especially Book VII) and has influenced philosophy ever since. Phenomenologists seek to *sense* reality and to describe it in words, rather than numbers—words that reflect consciousness and perception.

The philosophical foundations of phenomenology were developed by Edmund Husserl (1859–1938), who argued that the scientific method, appropriate for the study of physical phenomena, was inappropriate for the study of human thought and action (1964 [1907], 1999). Husserl was no antipositivist. What

was needed, he said, was an approach that, like positivism, respects the data that we acquire through our senses but is appropriate for understanding how human beings experience the world (Spiegelberg 1980:210). To do this requires putting aside—or bracketing—our biases so that we don't filter other people's experiences through our own cultural lens and can understand experiences as others experience them (Giorgi 1986; McNamara 2005:697; Moustakas 1994).

Husserl's ideas were elaborated by Alfred Schutz, and Schutz's version of phenomenology has had a major impact in social science, particularly in psychology and in anthropology. When you study molecules, Schutz said, you don't have to worry about what the world "means" to the molecules (1962:59). But when you try to understand the reality of a human being, it's a different matter entirely. The only way to understand social reality, said Schutz, was through the meanings that people give to that reality.

A phenomenological study, then, involves trying to: (1) see reality through another person's eyes; and (2) writing convincing descriptions of what those people experience rather than explanations and causes. Good ethnography—a narrative that describes a culture or a part of a culture—is usually good phenomenology. There is still no substitute for a good story, well told, especially if you're trying to make people understand how the people you've studied think and feel about their lives (**Further Reading:** phenomenology).

Humanism

Humanism is an intellectual tradition that traces its roots to Protagoras' (490–420 BCE) dictum that "Man is the measure of all things," which means that truth is not absolute but is decided by human judgment. Humanism has been historically at odds with the philosophy of knowledge represented by science (Box 1.5).

Box 1.5 Humanism and science

We are all free to identify ourselves as humanists or as positivists, but it's much more fun to be both. The scientific component of social science demands that we ask whether our measurements are meaningful—"it is certainly desirable to be precise," said Robert Redfield (1948:148), "but it is quite as needful to be precise about something worth knowing"—but the humanistic component forces us to ask if we are pursuing worthwhile ends and doing so with worthwhile means.

In the end, the tension between science and humanism is wrought by the need to answer practical questions with evidence and the need to understand ourselves—that is, the need to measure carefully and the need to listen hard.

Ferdinand C. S. Schiller (1864–1937), for example, was a leader of the European humanist revolt against positivism. He argued that since the method and contents of science are the products of human thought, reality and truth could not be "out there" to be found, as positivists assume, but must be made up by human beings (Schiller 1969 [1903]).

Wilhelm Dilthey (1833–1911) was another leader of the revolt against positivism in the social sciences. He argued that the methods of the physical sciences, while undeniably effective for the study of inanimate objects, were inappropriate for the study of human beings. There were, he insisted, two distinct kinds of sciences: the **Geisteswissenschaften** and the **Naturwissenschaften**—that is, the human sciences and the natural sciences. Human beings live in a web of meanings that they spin themselves. To study humans, he

argued, we need to understand those meanings (1989 [1883]).

Humanists, then, do not deny the effectiveness of science for the study of nonhuman objects, but emphasize the uniqueness of humanity and the need for a different (that is, nonscientific) method for studying human beings. Similarly, scientists do not deny the inherent value of humanistic knowledge. To explore whether King Lear is to be pitied or admired as a pathetic leader or as a successful one is an exercise in seeking humanistic knowledge. The answer to the question cannot possibly be achieved by the scientific method. In any event, finding *the* answer to the question is not important. Carefully *examining* the question of Lear, however, and producing many possible answers, leads to insight about the human condition. And that *is* important.

Just as there are many competing definitions of positivism, so there are for humanism as well. Humanism is often used as a synonym for humanitarian or compassionate values and a commitment to the amelioration of suffering. The problem is that died-in-the-wool positivists can also be committed to humanitarian values. Counting the dead *accurately* in Darfur is a really good way to preserve outrage. We need more, not less, science, lots and lots more, and more humanistically informed science, to contribute more to the amelioration of suffering and the weakening of false ideologies—racism, sexism, ethnic nationalism—in the world.

Humanism sometimes means a commitment to subjectivity—that is, to using our own feelings, values, and beliefs to achieve insight into the nature of human experience. In fact, trained subjectivity is the foundation of clinical disciplines, like psychology, as well as the foundation of participant observation ethnography. It isn't something apart from social science. (See Berg and Smith [1985] for a review of clinical methods in social research.)

Humanism sometimes means an appreciation of the unique in human experience. Writing a story about the thrill or the pain of giving birth, about surviving hand-to-hand combat, about living with AIDS, about winning or losing a long struggle with illness—or writing someone else's story for them, as ethnographers often do—are not activities *opposed* to a natural science of experience. They *are* the activities of a natural science of experience (**Further Reading:** humanities and the sciences).

ABOUT NUMBERS AND WORDS: THE QUALITATIVE/ QUANTITATIVE SPLIT

The split between the positivistic approach and the interpretive-humanistic approach pervades the human sciences. In psychology and social psychology, most *research* is in the positivistic tradition, while much *clinical* work is in the interpretivist tradition because, as its practitioners cogently point out, it works. In sociology, there is a growing tradition of interpretive research, but most sociology is done from the positivist perspective.

Notice the use of words like "approach," "perspective," and "tradition" in that last paragraph. Not once did I say that "Research in X is mostly quantitative" or that "Research in Y is mostly qualitative." That's because a commitment to a humanistic or a positivist epistemology is independent of any commitment to, or skill for, quantification. Searching the Bible for statistical evidence to support the subjugation of women doesn't turn the enterprise into science.

By the same token, at the early stages of its development, any science relies primarily on qualitative data. Long before the application of mathematics to describe the dynamics of avian flight, fieldworking ornithologists did systematic observation and recorded (in

words) data about such things as wing movements, perching stance, hovering patterns, and so on. Qualitative description is a kind of measurement, an integral part of the complex whole that comprises scientific research.

As sciences mature, they come naturally to depend more and more on quantitative data and on quantitative tests of qualitatively described relations. But this never, ever lessens the need for or the importance of qualitative research at every stage of science, from identifying interesting problems to explaining why things happen.

For example, qualitative research—say, talking to a few key informants—might lead us to say that "Most of the land in Centerville is controlled by a minority." Later, quantitative research—say, examining property records—might result in our saying "76% of the land in Centerville is controlled by 14% of the inhabitants." The first statement is not wrong, but its sentiment is confirmed and made stronger by the second statement. If it turned out that "54% of the land is controlled by 41% of the inhabitants," then the first part of the qualitative statement would still be true—more than 50% of the land is owned by less than 50% of the people, so most of the land is, indeed controlled by a minority—but the sentiment of the qualitative assertion would be rendered weak by the quantitative observations.

Suppose the relation is strong—that, in fact, 76% of the land in Centerville is controlled by 14% of the inhabitants. We still need qualitative research to explore the causes and consequences of this fact.

For social scientists whose work is in the humanistic tradition, quantification is inappropriate. And for those whose work is in the positivist tradition, it is important to remember that numbers do not automatically make any inquiry scientific. Never use the distinction between quantitative and qualitative as cover for talking about the difference between

science and humanism. Lots of scientists do their work without numbers, and many scientists whose work is highly quantitative consider themselves humanists.

ETHICS AND SOCIAL SCIENCE

The biggest problem in conducting a science of human behavior is not selecting the right sample size or making the right measurement. It's doing those things ethically, so you can live with the consequences of your actions. I'm not exaggerating about this. Ethics is part of method in science, just as it is in medicine or business, or any other part of life. For while scholars discuss the fine points about whether a true science of human behavior is really possible, effective social science is being done all the time and with rather spectacular, if sometimes disturbing, success.

Since the eighteenth century, every phenomenon to which the scientific method has been systematically applied, over a sustained period of time, by a large number of researchers, has yielded its secrets, and the knowledge has been turned into more effective human control of events. And that includes human thought and behavior. When Quételet and Comte were laying down the program for a science of human affairs in the mid-nineteenth century, no one could predict the outcome of elections, or help people through crippling phobias with behavior modification, or engineer the increased consumption of a particular brand of cigarettes. We may question the wisdom of engineering cigarette purchases in the first place, but the fact remains, we *can* do these things, we *are* doing these things, and we're getting better and better at it all the time.

It hardly needs to be pointed out that the increasing effectiveness of science over the

past few centuries has also given human beings the ability to cause greater environmental degradation, to spread tyranny, and even to cause the ultimate, planetary catastrophe through nuclear war. This makes a science of humanity even more important now than it has ever been before (**Further Reading:** ethics and social science).

Consider this: Marketers in a midwestern city, using the latest supercomputers, found that if someone bought disposable diapers at 5 p.m., the next thing he or she was likely to buy was a six-pack of beer. So they set up a display of chips next to the disposable diapers and increased snack sales by 17% (Wilke 1992). At the time, 20 years ago, that was a breakthrough in the monitoring of consumer behavior. Today, every time you buy something on the Internet or download a computer program or a piece of music, you leave a trail of information about yourself and your consumer preferences. By tracking your purchases over time and by sharing information about your buying behavior across websites, market researchers develop ads that are targeted just for you.

We need to turn our skills in the production of such effective knowledge to important problems: hunger, disease, poverty, war, environmental pollution, family and ethnic violence, and racism, among others. Social scientists can play important roles in social change by predicting the consequences of ethically mandated programs and by refuting false notions (such as various forms of racism) that are inherent in most popular ethical systems.

Don't get me wrong here. The people who discovered that fact about the six packs and the diapers are darned good social scientists, as are the people who design all those automated data-collection mechanisms for monitoring your behavior on the Internet. I'm not calling for rules to make all those scientists work on problems that I think are important. Scientists choose to study the things that industry and government pay for, and those things change from country to country and from time to time in the same country. Science has to earn its support by producing useful knowledge. What "useful" means, however, changes from time to time even in the same society, depending on all sorts of historical circumstances.

Suppose we agreed that "useful" meant to save lives. AIDS is a terrible disease, but over three times as many people died in motor vehicle accidents in the United States in 2006 as died of AIDS—about 40,000 and 12,000 respectively (SAUS 2010:Tables 116, 123). Should we spend three times more money teaching safe driving than we do teaching safe sex?

I think the answer is pretty clear. In a democracy, researchers and activists want the freedom to put their skills and energies to work on what they think is important. That's just how it is, and, personally, I hope it stays that way. In the rest of this book, I deal with some of the methods we can use to make useful contributions. But *you* have to decide what those contributions will be, and for whom they will be useful.

Key Concepts in This Chapter

epistemology	humanism	deduction
strategic methods	interpretivism	exploratory research
technique	tabula rasa	confirmatory research
rationalism	skepticism	hypothetico-deductive
empiricism	metaphysics	model of science
positivism	induction	Enlightenment

social contract logical positivism humanism
positivist school hermeneutics Geisteswissenschaften
social activism phenomenology Naturwissenschaften
Vienna Circle bracketing trained subjectivity
logical empiricism instrumental positivism

Summary

- The social and behavior sciences include psychology, social psychology, sociology, political science, economics, and anthropology.
  - In addition, many applied disciplines today use knowledge from all the social sciences and contribute fundamental knowledge to the social sciences. Some of these applied disciplines include criminology and penology, nursing, social work, and education.
- The intellectual foundations of modern social sciences come from eighteenth-century Enlightenment philosophy, which included an activist commitment to knowledge as the basis for human progress and a commitment to empiricism in the pursuit of knowledge.
  - This led to the intellectual position known as positivism. The alternative to positivism is humanism.
- Many social scientists today are asking legitimate questions about the scientific norms of objectivity and the universality of knowledge. Nevertheless, the social sciences have participated in the general success of science in the production of effect technologies that people want.
  - Opinion polls, auto and life insurance, marketing, product design, and behavioral therapy are among the many successes of modern social science.
- As with all science, there is no guarantee that effective knowledge will be used for benign and not for malignant purposes, so effective knowledge—whether in the physical, biological, or social sciences—creates an ethical imperative that is the focus of continuing discussion.

Exercises

1. Some people say that social science has little effect in the real world. Is there evidence to contradict this critique?

2. Explain the difference between the goals of humanists and those of positivists. Describe what you think might be the common ground for scholars in these camps. Is there common ground in their goals? In their epistemology? In their behavior as researchers?

3. Describe the difference between induction and deduction and the difference between rationalism and empiricism.

4. What does the saying "There's no such thing as value-free research" mean? Some scholars argue that, although value-free research is not possible, value-*neutral* research is. What do you think?

Further Reading

Epistemology and philosophy of science. Original sources: Descartes (1993 [1641]), Hume (1978 [1739–40]), Kant (1966 [1787]), Locke (1996 [1690]).

BonJour (1985), Campbell (1988), Campbell and Overman (1988), Cottingham (1988), Dancy (1985), Fuller (2004), Grayling (1996), Hollinger (1994), Hollis (1996), Kuhn (1970), Papineau (1996), Popper (1966, 1968), Rosenau (1992), Schweizer (1998).

The norms of science. Anderson, Ronning et al. (2010), Ben-David and Sullivan (1975), Jasanoff et al. (1995), Merton (1970, 1973), Resnik (2007), Storer (1966).

History of science. The definitive reference is the Cambridge History of Science (8 volumes [Porter 2003–2009]). See also Asimov (1989), Christianson (1984), Cottingham (1999), de Solla Price (1975), Drake (1978), Fermi and Bernardini (1961), Finocchiaro (2005), Hausman and Hausman (1997), Jacob and Stewart (2004), Machamer (1998), Markie (1986), Sarton (1952–1959), Schuster (1977), Selin (2008), Silver (1998), Weinberger (1985), Westfall (1993), M. D. Wilson (1991), Wormald (1993).

History of social science. Fisher (1993), Gordon (1993), McDonald (1993, 1994), Porter and Ross (2003), R. Smith (1997).

Positivism. Comte (1988), Giddens (1974), Neurath (1973), Richardson and Uebel (2007), Steinmetz (2005).

Hermeneutics and social science. Dilthey (1989 [1883], 1996), Jemielniak and Mikłaszewicz (2010), Mantzavinos (2005), Ormiston and Schrift (1990), Ricoeur (1981, 2007), Seebohm (2004).

Phenomenology. Creswell (1998), Giorgi (1986), McNamara (2005), Petoto et al. (1999).

Humanities and the sciences. Dilthey (1989 [1883]), Geertz (1973), Jones (1965), Kearney (1996), Rabinow and Sullivan (1987), Ricoeur (1981, 2007), Snow (1964), Weber (1978).

Ethics and social science. Becker (2004), Bosk (2004), Fielding (2008), Haggerty (2004), Hoeyer (2006), Keith-Spiegel and Koocher (2005), Mumford et al. (2009), Shrader-Frechette (1994). See also, **Ethics of Social Research**, in Chapter 3, **Further Reading** on deception and debriefing at the end of Chapter 4, and **Further Reading** on deception in field studies, Chapter 14.